

Quanterra  
 2800 George Washington Way  
 Richland, Washington 99352-1613

**0053548**

509 375-3131 Telephone  
 509 375-5590 Fax

**CERTIFICATE OF ANALYSIS**  
 Revised 6/13/00

Bechtel Hanford, Inc.  
 3350 George Washington Way  
 Richland, WA 99352

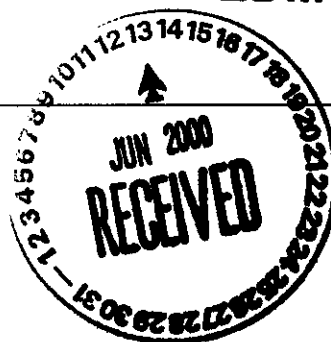
**RECEIVED**  
 AUG 17 2000

June 7, 2000

**EDMC**

Attention: Joan Kessner

SAF Number	:	B99-014
Date SDG Closed	:	May 31, 2000
Number of Samples	:	Two (2)
Sample Type	:	Water
SDG Number	:	W03187
Data Deliverable	:	7-Day / Summary



**I. Introduction**

On May 31, 2000, two water samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>STLR ID#</u>	<u>BHI ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
9DE0CE10	B0XC36	WATER	5/31/00
9DE0CH10	B0XC37	WATER	5/31/00

**II. Analytical Results/Methodology**

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical errors.

The requested analysis was: **Gas Proportional Counting**  
 Total Strontium by method RICH-RC-5006

Bechtel Hanford, Inc.  
June 13, 2000  
Page 2

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### III. Quality Control

The analytical results for each analysis performed under SDG W03187 includes a minimum of two Laboratory Control Samples (LCS) and one method (reagent) blank. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

### IV. Comments


#### **Gas Proportional Counting**

##### Total Strontium by method RICH-RC-5006:

The achieved MDA for samples B0XC36 does not meet the CRDL due to a reduced volume analyzed. The detected activity exceeds the achieved MDA and the data are accepted for reporting. Except as noted, the laboratory control samples, batch blank and sample results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

  
Jackie Waddell  
Project Manager

0003

### SAMPLE RESULTS

LAB NAME: STL Richland

SDG: /RPT GRP: W03187 / 10609

LOT,RPT DB ID: J0E310167-1 9DE0CE10

MATRIX: WATER

CLIENT ID: B0XC36

DATE RECEIVED: 5/31/2000 11:25:00 AM

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT- CH
STRONTIUM	2.27E+03		5.1E+01	6.1E+02	7.66E+00	pCi/L	91.90%	RICHRC5006	DE0CE	0152411

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Number of Results: 1

**SAMPLE RESULTS**

LAB NAME: STL Richland

SDG: /RPT GRP: W03187 / 10609

LOT,RPT DB ID: J0E310167-2 9DE0CH10

MATRIX: WATER

CLIENT ID: B0XC37

DATE RECEIVED: 5/31/2000 11:25:00 AM

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT- CH
STRONTIUM	5.21E+02		1.6E+01	1.4E+02	3.56E+00	pCi/L	97.20%	RICHRC5006	DE0CH	0152411

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Number of Results:

**BLANK RESULTS**

LAB NAME: STL Richland

SDG /RPT GRP: W03187 / 10609

LOT,RPT DB ID: J0E310000-411 DE10D11B

MATRIX: WATER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT- CH
STRONTIUM	-1.47E-01	U	1.3E+00	1.3E+00	3.12E+00	pCi/L	96.10%	RICHRC5006	DE10D	0152411

Number of Results:

**LABORATORY CONTROL SAMPLE**

LAB NAME: STL Richland                      SDG: /RPT GRP: W03187 / 10609  
LAB SAMPLE ID: DE10D12S                      MATRIX: WATER

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
STRONTIUM	7.06E+01		5.9E+00	2.0E+01	3.00E+00	pCi/L	94.20%	6.82E+01	103.44%

Number of Results: 1

## LABORATORY CONTROL SAMPLE

LAB NAME: STL Richland

SDG: /RPT GRP: W03187 / 10609

LAB SAMPLE ID: DE10D13S

MATRIX: WATER

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
STRONTIUM	7.08E+01		5.9E+00	2.0E+01	3.22E+00	pCi/L	94.20%	6.79E+01	104.41%

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Number of Results: 1

STL RICHLAND  
Data Review Checklist  
RADIOCHEMISTRY

*Priority*

Lot Number: <u>JOE310167</u>				
Client ID: <u>BH2</u>				
Due Date: <u>6-7-00</u>				
QC Batch Number: <u>0152411</u>		SDG Number: <u>W03187</u>		
Method Test Parameter: <u>TOTAL SR (TH)</u>				
Matrix: <u>Water</u>				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>A. Calibration</b>				
1. Is the calibration documentation included where applicable?			✓	
<b>B. Sample Analysis</b>				
1. Are the sample yields within acceptance criteria?	✓			
2. Were all sample holding times met?	✓			
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			
<b>C. QC Samples</b>				
1. Is the blank yield within acceptance criteria?	✓			
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			
3. Does the blank result meet the Contract criteria?	✓			
4. Is the blank result < the Contract Detection Limit?	✓			
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			
7. Is the LCS yield within acceptance criteria?	✓			
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?			✓	
<b>D. Other</b>				
1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			
3. Was the correct methodology used?	✓			
4. Was transcription checked?	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Were units checked?	✓			✓

Comments on any "No" response: Result > MDA > CRDL

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

First Level Review: *Pat K...* Date: 6-7-00 *9/2.*

Second Level Review: *[Signature]* Date: 6/7/00

LS-038, Rev.6, 5/00 **0009**  
**0010**



# CHAIN OF CUSTODY

0010

Q-27040

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-014-3		Page #Error of #Error			
Collector <b>KEVIN D. HUGHES</b>		Company Contact Julian Laurenz		Telephone No. 372-9582		Project Coordinator TRENT, SJ		Price Code 1D Data Turnaround 7 Days			
Project Designation 100-NR-2 Pump & Treat Operational Sampling		Sampling Location 100-NR-2 N-SPRINGS pump & treat		SAF No. B99-014		Air Quality <input type="checkbox"/>					
Ice Chest No. N/A		Field Logbook No. EL-1345-1		COA R10NR2CS60		Method of Shipment Govt Vehicle					
Shipped To Quanterra Incorporated		Offsite Property No.				Bill of Lading/Air Bill No.					
POSSIBLE SAMPLE HAZARDS/REMARKS  Contamination Due Special Handling and/or Storage 6-7-00				Preservation	N/A						
				Type of Container	P						
				No. of Container(s)	2						
				Volume	500mL						
SDG W03187 SAMPLE ANALYSIS JOE310167 <del>JOE310167</del> 5/31/00				SR90							
Sample No.	Matrix *	Sample Date	Sample Time								
Box #9 C36	water	5/31/00	0700	Y	DEECCE						
Box #10 C37	water	5/31/00	0705	X	DEOCH						
9/3 6/12/00											
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By	Date/Time	Received By	Date/Time					S-Soil SE-Sediment SO-Solid S-Slag W-Water O-Oil A-Air DE-Drum Solids DL-Drum Liquids T-Tissue WT-Wipe L-Liquid V-Vegetation X-Other			
Relinquished By	Date/Time	Received By	Date/Time								
Relinquished By	Date/Time	Received By	Date/Time								
Relinquished By	Date/Time	Received By	Date/Time								
Relinquished By	Date/Time	Received By	Date/Time								
Relinquished By	Date/Time	Received By	Date/Time								
LABORATORY SECTION		Received By		Title				Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time			

## Figure 1. Sample Check-in List

Date/Time Received: 5/31/00 1125 SDG#: W03187  
 Work Order Number: JOE310167 SAF#: B99-014  
 Shipping Container ID: na Chain of Custody #: B99-014-3

1. Outermost shipping container damaged? Yes ☐ No ☒
2. Custody Seals on shipping container intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain-of-Custody record present? Yes ☒ No ☐
5. Chain-of-Custody includes the following information:
 

- Client name	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Project name or number	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Sample date/time for each sample	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Container types, sizes and number of containers	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Short description of sample, i.e., matrix	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Analyses requested	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Preservation used or "none" or N/A if not applicable	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Date and time of relinquish and receipt	Yes <input type="checkbox"/> No <input type="checkbox"/>
- Signatures of those persons relinquishing and receiving	Yes <input type="checkbox"/> No <input type="checkbox"/>
6. Sample numbers on chain of custody match those on sample containers? Yes ☒ No ☐
7. Collection date and date of laboratory receipt are within project specific holding time requirements? Yes ☒ No ☐ *2 bottles*
8. Cooler temperature: na
9. Vermiculite/packing materials is: na Wet: ☐ Dry: ☒

10.	Samples have: <input checked="" type="checkbox"/> tape <input checked="" type="checkbox"/> custody seals	<input type="checkbox"/> hazard labels <input type="checkbox"/> appropriate sample labels
11.	Samples are: <input checked="" type="checkbox"/> in good condition <input type="checkbox"/> broken	<input type="checkbox"/> leaking <input type="checkbox"/> have air bubbles

12. Were any anomalies identified in sample receipt? Yes ☐ No ☒
13. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian/Laboratory: [Signature] Date: 5/31/00  
 Telephone/Fax/E-mailed to: \_\_\_\_\_ On \_\_\_\_\_ By \_\_\_\_\_

# Client Sample Screening Results

31-May-00

5/31/00

CLIENT CODE	ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B	
BIII	BOXC36	DECE	5/31/2000 1:10:00 PM	QUAD23C	5/31/2000 1:51:49 PM	BOXN09DECE	30	7	0.178333333	126	3.235	
	DECE	LIQUID		Bkg:	5/31/2000 2:05:41 AM	BKG	600	33	0.055	579	0.965	
Ant Date:	5/31/00	Tot Sa, Alq:	5.00E-01	1.00E+00	Alp:	(Dpm/ 4.26E-01	(uCi/ 9.59E-05	(pCi/ 1.92E+02	+ 2.0E+02	CAT	1.3E-01	Lab
Ppt mg:	0	Units:	L	ml	Bet:	Alq: 6.16E+00	Sa): 1.39E-03	L/g): 2.77E+03	+ 3.3E+02	1	1.8E-02	Alq
												L/g
BIII	BOXC37	DECE	5/31/2000 1:10:00 PM	QUAD23D	5/31/2000 1:51:49 PM	BOXN10DECE	30	7	0.178333333	53	0.825	
	DECE	LIQUID		Bkg:	5/31/2000 2:05:41 AM	BKG	600	33	0.055	565	0.94166667	
Ant Date:	5/31/00	Tot Sa, Alq:	5.00E-01	1.00E+00	Alp:	(Dpm/ 5.08E-01	(uCi/ 1.14E-04	(pCi/ 2.29E+02	+ 2.1E+02	CAT	1.1E-01	Lab
Ppt mg:	0	Units:	L	ml	Bet:	Alq: 1.45E+00	Sa): 3.28E-04	L/g): 6.55E+02	+ 2.1E+02	1	7.6E-02	Alq
												L/g

0013

31-May-00

Quanterra Environment Services, SCP V2.03

1

RQC053

Parent Batch:  
Associated Batches::  
:  
:  
:**PRIORITY**  
7daySevern Trent Laboratories, Inc.  
Information Sheet Rad Prep\*\*\*\*\*  
\* QC BATCH: 0152411 \*  
\*\*\*\*\*

W03187

TH: Total Strontium by GPC  
CG: Sr-Total Prp/SepRC5006  
SI: CLIENT: HANFORD**PRIORITY**

7day

Run Date: 5/31/00  
Time: 15:59:02

Page: 1

Analytical Due Date: 6/07/00

Project Manager: JW2

Lot#	Analyst	Due	Client Name	Geometry	Count	Time	Mid/Ave Date/Time	Tracer ID Spike ID	CRDL	Units	Screen Info - (Ci)	PM Bin
Work Order	Client Matrix	Aliquot									Alpha Beta	
JOE310167-001	6/07/00	Bechtel Hanford,										
DE0CE-1-01 WATER		.0000			.000	5/31/00	7:00		2.00E+00	pCi/L	**NYS **NYS	JW2
Comments: WATER											64-05/00	
		80 ml										
JOE310167-002	6/07/00	Bechtel Hanford,										
DE0CH-1-01 WATER		.0000			.000	5/31/00	7:05		2.00E+00	pCi/L	**NYS **NYS	JW2
Comments: WATER											64-05/00	
JOE310000-411 B	6/07/00	Bechtel Hanford,										
DE10D-1-01 WATER						5/31/00	7:00		2.00E+00	pCi/L	**NA **NA	JW2
Comments:												
JOE310000-411 C	6/07/00	Bechtel Hanford,										
DE10D-1-02 WATER						5/31/00	7:00		2	pCi/L	**NA **NA	JW2
Comments:												
JOE310000-411 C	6/07/00	Bechtel Hanford,										
DE10D-1-03 WATER						5/31/00	7:00		2	pCi/L	**NA **NA	JW2
Comments:												

Total Number of Samples In Batch: 00005

Batch Information:

Dry Wt: N

Decay Correct: Y

Blank Sub: None

Call In: -

Uncert: Both

Sigma: 1.960

ODR: Target List + Other Detected

BLANK CRDL  
Strontium 90

2.00E+00

Tracer Yield  
Strontium Trace (020-105)Type  
RPDQC Control Limits

\*\* NYS = Not Yet Screened

\*\* NA = Not Applicable

\*\* Other = Other than Gross Alpha or Gross Beta

++ Indicates that Batch Information has changed for this sample. Print worksheet for details.

0014

COC Signature Page

W03187

Lot or Batch #: 0152411	Initials/Date	Procedure #
Released By	<del>RTM</del> 6-2-00	Rehxxxxxx
Received	RTM 6/5/00	RichRC5006
Released By	RTM 6/6/00	n/a
Received	EPS 6/6/00	RICHARD 0003.2
Released By	QA 6/6/2000	n/a
Received	RM 6-7-00	Radcal 2-8.2-1
Released By	RM 6-7-00	n/a
Received	PK 6-7-00	RichRC0002
Released By	PK 6-7-00	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

SDR # B00-100Revision #: 0Date Initiated: 06/8/00

## SAMPLE DISPOSITION RECORD

SAF: B99-014

OU: 100-NR-2

Project ID: 100-NR-2 TS

Task ID: 1

Sampling Event: Pump and Treat Operational Sampling

Laboratory: Severn Trent Inc, (Quanterra)

Task Manager: Laurenz, J.E.

## Sampling Information:

Number of Samples: 2

ID Numbers: B0XC36 and B0XC37

Matrix: water

Collection Date: 5/31/00

## Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Clarification of direction.

Description: Chain of custody requested Sr-90. The correct analysis request should have been for total rad Sr. Laboratory performed the correct analysis and reported total rad Sr on 6/7/00. The purpose of this SDR is to document the discrepancy between the intended analysis and the requested analysis.

## Disposition:

## Description:

Justification: The purpose of this SDR is to document the discrepancy between the intended analysis and the requested analysis.

## Approval Signatures:

S. J. Trent

Project Coordinator (Print/Sign Name)

Date

J. E. Laurenz

Task Manager (Print/Sign Name)

Date

SDR # B00-102Revision #: 0Date Initiated: 06/7/00

## SAMPLE DISPOSITION RECORD

SAF: B99-014

OU: 100-NR-2

Project ID: 100-HR-1 RM Action

Task ID: 1

Sampling Event: Pump and Treat Operational Sampling

Laboratory: Quanterra

Task Manager: Laurenz, J.E.

## Sampling Information:

Number of Samples: 2

ID Numbers: B0XN09 and B0XN10

Matrix: water

Collection Date: 05/31/00

## Issue Background:

Class: ☐ Project Data Use ☐ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Other

Description: Sample numbers used twice

Disposition: Samples were reassigned new numbers by Sample Management as follows:  
B0XN09 is now B0XC36 and B0XN10 is now B0XC37

Description: Operator used previously assigned sample numbers.

Justification: The use of unique sample numbers is a coded constraint in HEIS.

## Approval Signatures:

S. J. Trent

Project Coordinator (Print/Sign Name)

Date

J.E. Laurenz

Task Manager (Print/Sign Name)

Date